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SPECIFICATION FOR INDIAN KAPOK
(*First Revision*)

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Gr 3 *April* 1981

Indian Standard
SPECIFICATION FOR INDIAN KAPOK
(First Revision)

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Indian Standard
SPECIFICATION FOR INDIAN KAPOK
(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 15 December 1980, after the draft finalized by the Cotton and Cotton Products Sectional Committee had been approved by the Textile Division Council.

0.2 This standard, originally published in 1965, specified the requirements in respect of buoyancy ratio which does not provide a complete assessment of quality of kapok. The standard has been taken up for revision to make it more comprehensive by specifying the limit of permissible impurities and also the moisture content.

0.3 The Indian kapok, the seed-floss of either of the two trees *Salmalia malabaricum* (*DC*) or *Ceiba pentandra* Linn., is used for life saving jackets, stuffing of sleeping bags required to provide warmth and also for ordinary stuffing purposes, such as pillows and mattresses.

0.4 To familiarize the industry with International System of units (SI Units), the recommended SI units for use in the textile industry are given in Appendix B.

0.4.1 Standards of Weights and Measures Act, 1976 also stipulates use of SI Units.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements of three grades of Indian kapok intended for stuffing purposes as given below:

Grade 1 — for life saving jackets

---

*Rules for rounding off numerical values (*revised*).

Grade 2 — for sleeping bags required to provide warmth

Grade 3 — for ordinary stuffing purposes, such as pillows and mattresses.

2. GENERAL REQUIREMENTS

2.1 The kapok should be soft and smooth and should have a silky appearance. It should be clean and reasonably free from seeds and other fibre.

3. SPECIFIC REQUIREMENTS

3.1 The kapok shall conform to the requirements of buoyancy ratio, permissible impurities and moisture content as give in Table 1.

TABLE 1 SPECIFIC REQUIREMENTS OF KAPOK

(*Clauses* 3.1 *and* 6.4)

SL No.	REQUIREMENT	GRADE			METHOD OF TEST, REF TO CL No.
		1	2	3	
1	Buoyancy ratio, *Min*				
	a) Before soaking	19	17	14	A-2
	b) After soaking	16	14	11	A-3
2	Permissible impurities, percent, *Max*	2	3	5	A-4
3	Moisture content, percent, *Max*	10	10	10	5 of IS : 199-1973*

*Method for determination of moisture, total size or finish, and fatty matter in grey and finished cotton textile materials (*second revision*).

4. PACKING

4.1 Kapok shall be packed in press-packed bales. The bale shall be wrapped with a layer each of hessian (Variety 4 of IS : 8569-1977*), polyethylene film of minimum 40 microns thickness (*see* IS : 2508-1977†) and heavy cee cloth (*see* IS : 3751-1966‡). The bale when packed shall not weigh more than 75 kg and the bales shall not be packed to a density of more than 1 g/cm^3.

5. MARKING

5.1 The bales shall be marked with the following information:

a) Name of the material;

b) Grade;

---

*Specification for jute fabrics used in the packing of textile products.

†Specification for low density polyethylene films.

‡Specification for heavy cee cloth.

c) Producer's name, initials or trade-mark, if any; and
d) Month & year of packing.

5.1.1 The product may also be marked with Standard mark.

5.1.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. SAMPLING

6.1 Lot — In any consignment all the bales of kapok of the same grade delivered to a buyer against a despatch note shall constitute a lot.

6.2 Unless otherwise agreed to between the buyer and the seller, the number of bales to be selected at random from a lot shall be as given in Table 2.

TABLE 2 NUMBER OF BALES TO BE SELECTED

No. of Bales in the Lot (1)	No. of Bales to be Selected (2)
Up to 3	All
4 ,, 15	3
16 ,, 25	4
26 ,, 50	5
51 and above	7

6.2.1 To ensure the randomness of selection, methods given in IS : 4905-1968* shall be followed.

6.3 From each bale so selected the requisite quantity of kapok shall be drawn from different parts of the bale by making use of a suitable instrument. The quantity drawn from each bale shall be mixed thoroughly before preparing the test specimen. The number of test specimen tested shall be equal to the number of bales selected.

---

*Methods for random sampling.

6.4 The lot shall be considered conforming to the requirements of this standard if the conditions given below are satisfied:

a) From the observed values of buoyancy before and after soaking the average $\bar{X}$ and the range R are calculated separately and the value of the expressions $\bar{X} — 0{\cdot}4R$ is greater than or equal to the corresponding limit given in Table 1.

b) From the observed value of impurities and moisture content the average $\bar{X}$ and the range R are calculated and the value of the expression $\bar{X} + 0\ 4\ R$ is less than or equal to the corresponding limit given in Table 1.

APPENDIX A

(*Table* 1)

METHODS OF TEST

A-1. CONDITIONING OF TEST SPECIMENS

A-1.1 The test specimens shall be conditioned in standard atmosphere of 27 ± 2°C temperature and 65 ± 2 percent relative humidity for 24 hours (*see also* IS : 6359-1971*).

A-2. BUOYANCY RATIO BEFORE SOAKING

A-2.1 Weigh accurately a 40 g sample of kapok. Fill it in a muslin or cambric bag 15 × 15 cm when measure flat. The bag shall be provided with a loop by stitching a tape measuring 2 × 1 cm on one of its surfaces at the centre of the bag (*see* Fig. 1). Stitch the mouth of the bag. Place the kapok-filled bag with the looped surface facing downward over clean water in a suitable container with a 400 g dead mass hooked on to the loop. The dead mass arrangement shall have a base for accommodating additional slotted weights (*see* Fig. 2) (*see* Note).

NOTE — Weights made of copper or its alloy shall be used for the purpose of this test.

A-2.2 Place additional weights on the base of the dead mass under water, till with the addition of a further 5 g mass, the bag starts sinking.

A-2.3 Note this mass as the total mass (including the dead weight) which the bag can support.

---

*Method for conditioning of textiles.

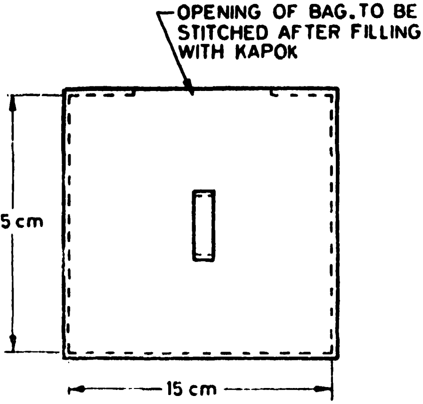

Fig. 1 Buoyancy Bag

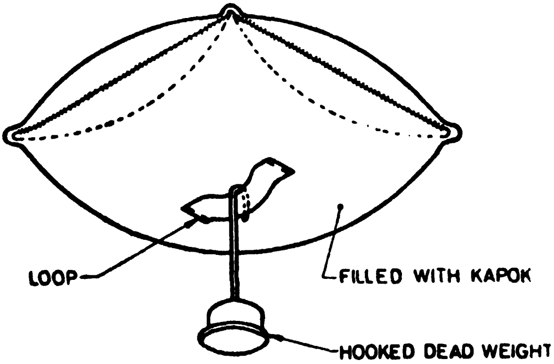

Fig. 2 Buoyancy Bag Showing Arrangement for Weight

A-2.4 Calculate the buoyancy ratio before soaking of kapok by the following formula:

$$\text{Buoyancy ratio before soaking} = \frac{W_1\left(1 - \frac{1}{d}\right)}{W}$$

where

W_1 = mass in grams, which the bag can support (*see* **A-2.3**);
d = specific gravity of the weights used; and
W = mass, in grams of kapok (*see* **A-2.1**).

A-3. BUOYANCY RATIO AFTER SOAKING

A-3.1 Keep in bag containing kapok (*see* **A-2.2**) completely immersed in water with the help of a sinker for 72 hours. After the expiry of 72 hours, remove the sinker and allow the bag to float on the surface of water.

A-3.2 Suspend the dead mass arrangement from the loop of the bag and start placing additional slotted mass on the base of the dead mass till the bag just begins to sink (*see also* **A-2.2**).

A-3.3 Note this mass (including the dead mass) as the mass which the bag can support.

A-3.4 Calculate the buoyancy ratio of kapok after soaking by the following formula:

$$\text{Buoyancy ratio after soaking} = \frac{W_2\left(1-\frac{1}{d}\right)}{W}$$

where

W_2 = mass, in grams, which the bag can support (*see* **A-3.3**);
d = specific gravity of the weights used; and
W = mass, in grams, of kapok (*see* **A-2.1**).

A-4. PERCENTAGE OF IMPURITIES

A-4.1 Take a test specimen weighing approximately 10 g and determine its mass accurately. Tease the specimen thoroughly by hand to clean out seeds, seed coat particles, leafy bits, dust and dirt, etc. The impurities thus separated shall be weighed accurately. Determine the percentage of impurities by the following formula:

$$\text{Impurities, percent} = \frac{W_1 \times 100}{W}$$

where

W_1 = mass of test specimen, and
W = mass of impurities.

A-4.2 Repeat the test on two more test specimens and determine the average impurities percentage of three test specimens.

APPENDIX B

(*Clause* 0.4)

RECOMMENDED SI UNITS FOR TEXTILES

Sl No.	Characteristic	SI Unit		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
1)	Length	Millimetre	mm	Fibres
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Metre	m	Yarns, ropes, cordage, fabrics
2)	Width	Millimetre	mm	Narrow fabrics
		Centimetre	cm	Other fabrics
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Centimetre, metre	cm, m	Carpets, druggets, *DURRIES* (as appropriate)
3)	Thickness	Micrometre (micron)	µm	Delicate fabrics
		Millimetre	mm	Other fabrics, carpets, felts
4)	Linear density	Tex	tex	Yarns
		Millitex	mtex	Fibres
		Decitex	dtex	Filaments, filament yarns
		Kilotex	ktex	Slivers, ropes, cordage
5)	Diameter	Micrometre (micron)	µm	Fibres
		Millimetre	mm	Yarns, ropes, cordage
6)	Circumference	Millimetre	mm	Ropes, cordage
7)	Threads in fabric			Woven fabrics (as appropriate)
	a) Lengthwise	Number per centimetre	ends/cm	
		Number per decimetre	ends/dm	
	b) Widthwise	Number per centimetre	picks/cm	
		Number per decimetre	picks/dm	
8)	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9)	Stitches in knitted fabric			Knitted fabrics (as appropriate)
	a) Lengthwise	Courses per centimetre	courses/cm	
		Courses per decimetre	courses/dm	
	b) Widthwise	Wales per centimetre	wales/cm	
		Wales per decimetre	wales/dm	

SL No.	CHARACTERISTIC	SI UNIT		APPLICATION
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
10)	Stitch length	Millimetre	mm	Knitted fabrics, made-up items
11)	Mass per unit area	Grams per square metre	g/m^2	Fabrics
12)	Mass per unit length	Grams per metre	g/m	Fabrics
13)	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes, cordage (as appropriate)
14)	Test or gauge length	Millimetre, centimetre	mm, cm	Fibre, yarn and fabric specimens (as appropriate)
15)	Breaking load	Millinewton	mN	Fibres, delicate yarns (individual or skeins)
		Newton	N	Strong yarns (individual or skeins), ropes, cordage, fabrics
16)	Breaking length	Kilometre	km	Yarns
17)	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18)	Twist factor or twist multiplier	Turns per centimetre × square root of tex Turns per metre × square root of tex	$\text{turns/cm} \times \sqrt{\text{tex}}$ $\text{turns/m} \times \sqrt{\text{tex}}$	Yarns (as appropriate)
19)	Bursting strength	Newton per square centimetre	N/cm^2	Fabrics
20)	Tear strength	Millinewton, newton	mN, N	Fabrics (as appropriate)
21)	Pile height	Millimetre	mm	Carpets
22)	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	$g/m^2/mm$ pile height	Pile carpets
23)	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands

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Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 1 AUGUST 1983
TO
IS:3040-1980 SPECIFICATION FOR INDIAN KAPOK

(First Revision)

(This amendment is carried out to specify the various botanical names of kapok used as stuffing material.)

Alteration

(*Page 3, clause 0.3*) - Substitute the following for the existing clause:

'0.3 The Indian Kapok, the seed floss of the trees *Ceiba pentadra* (Java Kapok), *Bombax Malabarica* or *Salmalia Malabarica* (Indian Kapok) is used for stuffing life saving jackets and sleeping bags required to provide warmth and also for ordinary stuffing purposes such as pillows and matteresses. Floss fibres from various plants are also referred to as kapok in general and are used for stuffing purposes.'

(TDC 2)

Reprography Unit, ISI, New Delhi, India

AMENDMENT NO. 2 MARCH 1990
TO
IS 3040 : 1980 SPECIFICATION FOR INDIAN KAPOK

(First Revision)

(This amendment is being issued to remove the ambiguity in interpretation of the test results with respect to the requirements specified in the standard.)

(*Page* 4, *Table* 1, *Sl No.* 1 *and* 2, *col* 'Grade') — Substitute the following for the existing matter:

SL No.	GRADE		
	(1)	(2)	(3)
1	19·0	17·0	14·0
	16·0	14·0	11·0
2	2·0	3·0	5·0

(*Page* 4, *clause* **2.1**, *list line*) — Insert the following at the end of the sentence :

'(*see* IS 667 : 1981§)'

---

§Method for identification of textile fibres.

(TDC 2)

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